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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/352,959	07/14/1999	PAUL W. CAMPBELL	0100.9900940	2833

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MARKISON & RECKAMP, PC  
PO BOX 06229  
WACKER DR  
CHICAGO, IL 60606-0229

EXAMINER

VITAL, PIERRE M

ART UNIT	PAPER NUMBER
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2186

DATE MAILED: 08/29/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/352,959

Applicant(s)

CAMPBELL, PAUL W.

Examiner

Pierre M. Vital

Art Unit

2186

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 14 July 1999.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on 14 July 1999 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Specification*

1. The disclosure is objected to because of the following informalities:

The acronyms PCI and GART have not been described in detail in the specification. The meaning of every acronym used in the specification should be apparent from the descriptive portion of the specification with clear disclosure as to its imports. Usually, the meaning of each acronym may be introduced the first time these acronyms occur in the specification.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 2-6 and 13-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 2, 4, 13 and 15 recite the limitation "retrieving a physical page address". It is not clear *where* the physical page address is retrieved in the claims.

Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

5. Claims 1 and 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Nakatsuka et al (US6,433,782).

As per claims 1 and 12, discloses a processing module [abstract, line 2]; memory operably coupled to the processing module to [abstract, lines 2-3]; (a) receive a memory access request that includes a virtual address [column 1, lines 31-32, 39-40]; (b) determine whether a physical address translation has been performed for the virtual address, wherein the physical address translation translates the virtual address to an address, wherein the address is a physical address of memory or is further translated to obtain another physical address of the memory [column 8, line 66 – column 9, line 9]; and (c) when the physical address translation or the another has been performed for

the virtual address, utilizing the physical address to obtain data corresponding to the memory access request [column 8, line 66 – column 9, line 12].

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 3, 7, 14 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakatsuka et al (US6,433,782) and Williams et al (US6,199,151).

As per claims 7 and 18, Nakatsuka discloses a processing module [abstract, line 2]; and memory operably coupled to the processing module, wherein the memory stores operational instructions that cause the processing module to [abstract, lines 2-3]; (a) translate a virtual address into an address [column 9, lines 5-8]; (b) determine whether the address corresponds to translation memory space [column 9, lines 13-16]; (d) translate the address into another address when the address corresponds to translation memory space; (e) caching the another address in the translation look aside [column 8, line 66 – column 9, line 39].

However, as per claims 3, 7, 14 and 18, Nakatsuka does not specifically teach caching the address in a translation look aside table when the address does not correspond to the translation memory space.

Williams discloses the concept of caching the address in a translation look aside table when the address does not correspond to the translation memory space [column 2, lines 43-48].

It would have been obvious to one of ordinary skill in the art, having the teachings of Nakatsuka and Williams before him at the time the invention was made to modify the system of Nakatsuka to include caching the address in a translation look aside table when the address does not correspond to the translation memory space as taught by Williams because it would have improved system performance by providing increased speed in the translation of a future address to physical address so that the physical address would be found directly in the TLB.

8. Claims 2, 4, 8-11, 13, 15 and 19-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakatsuka et al (US6,433,782) and Hays et al (US6,356,989).

As per claims 2, 4, 13 and 15, Nakatsuka discloses the claimed invention as detailed above in the previous paragraphs. Nakatsuka further discloses determining whether the physical page address corresponds to a physical address requiring further translation [column 9, lines 13-16].

However, Nakatsuka does not specifically teach when a physical address translation has not been performed for the virtual address, retrieving a physical page address; when the physical page address does not correspond to a physical address that requires further translation, utilizing the physical page address and a portion of the virtual address to produce the physical address

Hays discloses when a physical address translation has not been performed for the virtual address, retrieving a physical page address [column 1, lines 55-58]; when the physical page address does not correspond to a physical address that requires further translation, utilizing the physical page address and a portion of the virtual address to produce the physical address [column 1, lines 52-58].

It would have been obvious to one of ordinary skill in the art, having the teachings of Nakatsuka and Hays before him at the time the invention was made to modify the system of Nakatsuka to include when a physical address translation has not been performed for the virtual address, retrieving a physical page address; when the physical page address does not correspond to a physical address that requires further translation, utilizing the physical page address and a portion of the virtual address to produce the physical address because it would have improved system performance by increasing the speed in the translation of an address to a physical address.

As per claims 8 and 19, Hays discloses indexing a page directory based on a first portion of the virtual address to retrieve a page directory entry; indexing a page table based on the page directory and a second portion of the virtual address to retrieve a page table entry as at least part of the address [column 1, lines 45-58].

As per claims 9 and 20, Nakatsuka discloses determining whether the page table entry is in video graphics memory space [column 13-22].

As per claims 10, 11, 21 and 22, Hays discloses caching and translating the page directory entry, the page table entry, and a third portion of the virtual address as the address [column 1, lines 55-58].


**Conclusion**

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Applicant is required under 37 C.F.R. § 1.111 (c) to consider these references fully when responding to this action. The documents cited therein teach virtual to physical translation, graphics translation, translation using TLB.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pierre M. Vital whose telephone number is (703) 306-5839. The examiner can normally be reached on Mon-Fri, 8:30 am - 6:00 pm, alternate Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt Kim can be reached on (703) 305-3821. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-7239 for regular communications and (703) 746-7238 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-9000.

  
Pierre M. Vital  
August 26, 2002

  
MATTHEW KIM  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2100

**Attachment for PTO-948 (Rev. 03/01, or earlier)**  
**6/18/01**

**The below text replaces the pre-printed text under the heading, "Information on How to Effect Drawing Changes," on the back of the PTO-948 (Rev. 03/01, or earlier) form.**

**INFORMATION ON HOW TO EFFECT DRAWING CHANGES**

**1. Correction of Informalities -- 37 CFR 1.85**

New corrected drawings must be filed with the changes incorporated therein. Identifying indicia, if provided, should include the title of the invention, inventor's name, and application number, or docket number (if any) if an application number has not been assigned to the application. If this information is provided, it must be placed on the front of each sheet and centered within the top margin. If corrected drawings are required in a Notice of Allowability (PTOL-37), the new drawings **MUST** be filed within the **THREE MONTH** shortened statutory period set for reply in the Notice of Allowability. Extensions of time may NOT be obtained under the provisions of 37 CFR 1.136(a) or (b) for filing the corrected drawings after the mailing of a Notice of Allowability. The drawings should be filed as a separate paper with a transmittal letter addressed to the Official Draftsperson.

**2. Corrections other than Informalities Noted by Draftsperson on form PTO-948.**

All changes to the drawings, other than informalities noted by the Draftsperson, **MUST** be made in the same manner as above except that, normally, a highlighted (preferably red ink) sketch of the changes to be incorporated into the new drawings **MUST** be approved by the examiner before the application will be allowed. No changes will be permitted to be made, other than correction of informalities, unless the examiner has approved the proposed changes.

**Timing of Corrections**

Applicant is required to submit the drawing corrections within the time period set in the attached Office communication. See 37 CFR 1.85(a).

Failure to take corrective action within the set period will result in **ABANDONMENT** of the application.